

A 16384-channel 8GHz Bandwidth Polyphase Spectrometer, Phase II

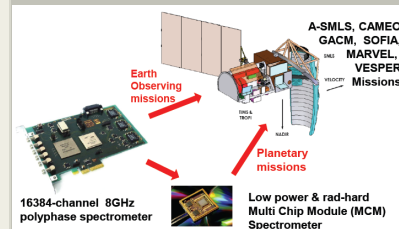
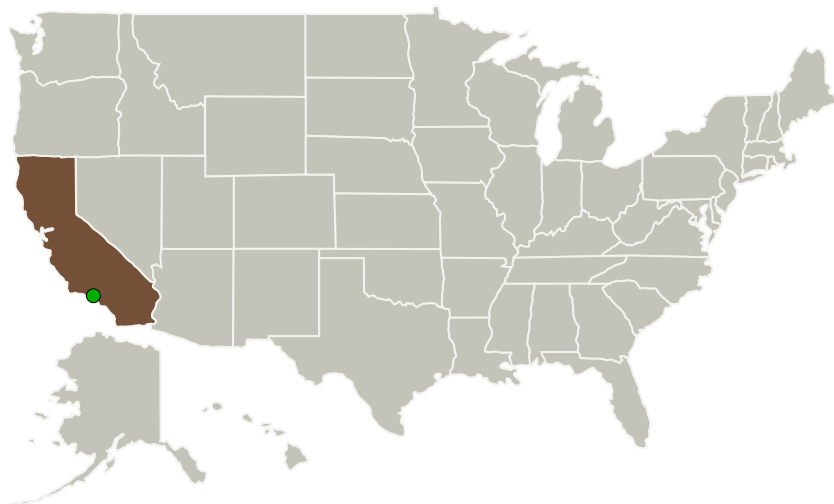
Completed Technology Project (2012 - 2015)



Project Introduction

Growing concern over global climatic and environmental changes and our urgent need to quantify track and understand their impact on our planet's atmosphere, oceans, and land surfaces have prompted the development of extremely sensitive and technologically sophisticated instruments. To meet the challenges of these next generation instruments, a new class of high performance electronics needs to be developed. In this SBIR Phase II proposal, Mosaix proposes to design and build two separate low power, and compact single board digital poly-phase Fast Fourier Transform spectrometer (FFTS) optimized for the back-end signal processing requirements of next generation instruments. These two spectrometer designs are targeted to meet different mission requirements and leverage a common FPGA based digital electronic design and spectrometer IP core. Whilst sharing a common architecture, the boards differ in the analog-to-digital (ADC) samplers used at the front-end of the spectrometer and the actual FPGA device used for the digital signal processing tasks. The first spectrometer design is for a 8 GHz bandwidth spectrometer targeted for earth observing (EOS) missions. The second spectrometer design is for a 750 MHz bandwidth spectrometer targeted for planetary radiometer missions. The spectrometers developed under this SBIR will be state-of-the-art spectrometers.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Mosaix Technologies, Inc.	Lead Organization	Industry	Monrovia, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Project Transitions

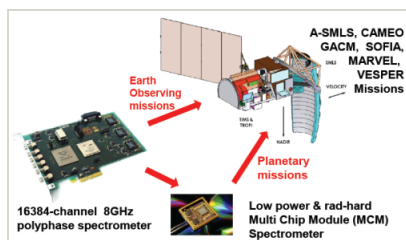
▶ **April 2012:** Project Start

✓ **September 2015:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137398>)

Images



Project Image

A 16384-channel 8GHz Bandwidth Polyphase Spectrometer
(<https://techport.nasa.gov/image/129556>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Mosaix Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Raoul Tawel

Co-Investigator:

Raoul Tawel

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Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.3 Optical Components

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System